WHAT IS CLAIMED IS:

1. A failure diagnosis apparatus for secondary air supplier, which is adapted to detect an anomaly of a component of a secondary air supplier based on a pressure value and a pressure pulsation in a secondary air supply path of the secondary air supplier configured to supply secondary air to upstream of an exhaust emission purifying device of an internal combustion engine,

the failure diagnosis apparatus comprising a pressure sensor for detecting pressure in the secondary air supply path; and failure diagnosing means for diagnosing a failure based on the pressure and pressure pulsation detected by the pressure sensor, wherein the failure diagnosing means varies a determination threshold for detecting presence or absence of pressure pulsation according to the pressure in the secondary air supplier.

2. The failure diagnosis apparatus according to Claim 1, wherein the failure diagnosing means increases the determination threshold with increase in the pressure in the secondary air supplier.

3. The failure diagnosis apparatus according to Claim 1, wherein the failure diagnosing means detects a failure of each component, based on a pressure behavior pattern during secondary air supply and a pressure

behavior pattern without secondary air supply.

4. The failure diagnosis apparatus according to Claim 1, wherein the secondary air supplier further comprises an air pump and switching means disposed downstream of the air pump, wherein the pressure sensor detects the pressure value in the supply path between the switching means and the air pump.

5. A failure diagnosis apparatus for secondary air supplier, comprising:

a secondary air supply path connected to an upstream exhaust path of an emission purifying catalyst disposed on the exhaust path of an internal combustion engine;

secondary air supplying means for supplying air through the secondary air supply path onto the exhaust path;

a pressure sensor for detecting pressure in the secondary air supply path; and

failure diagnosing means for diagnosing a failure of the secondary air supplying means based on the pressure detected by the pressure sensor,

wherein the failure diagnosing means varies a determination threshold according to the pressure detected by the pressure sensor, determines whether a pressure pulsation exists or not based on the pressure and the determination threshold, and makes a failure

diagnosis based on the presence or absence of pressure pulsation.

6. The failure diagnosis apparatus according to Claim 5, wherein the failure diagnosing means varies the determination threshold according to an average or smoothed value of the pressure detected by the pressure sensor, and

determines whether the pressure pulsation exists or not based on the determination threshold and a sum of the average or smoothed values.

7. The failure diagnosis apparatus according to Claim 5, wherein the failure diagnosing means determines the determination threshold based on the pressure detected by the pressure sensor and determines whether the pressure pulsation exists or not based on the determination threshold and a sum concerning the detected pressure.

8. The failure diagnosis apparatus according to Claim 7, wherein the sum is a sum of absolute values of differences between measured value and smoothed value of the detected pressure.

9. The failure diagnosis apparatus according to Claim 7, wherein the sum is a sum of lengths of loci of the detected pressure.

10. The failure diagnosis apparatus according to Claim 6, comprising a pump as the secondary air

supplying means on the secondary air supply path, and a switching valve downstream of the pump, wherein the pressure sensor detects the pressure between the pump and the switching valve.

11. The failure diagnosis apparatus according to Claim 10, wherein the pressure sensor detects the pressure both with and without a secondary air supply by the secondary air supplying means, and wherein the failure diagnosing means specifies a failure part based on the detected pressures with and without the secondary air supply.

12. The failure diagnosis apparatus according to Claim 6, wherein, after determining that there is a pressure pulsation, the failure diagnosing means determines whether the pressure pulsation is one due to exhaust pulsation, based on magnitude of the detected pressure.

13. The failure diagnosis apparatus according to Claim 6, wherein the pressure sensor detects the pressure both with and without a secondary air supply by the secondary air supplying means, and wherein the failure diagnosing means classifies pressure variations both with and without the secondary air supply into preset pressure behavior patterns and makes a failure diagnosis based on a combination of the pressure behavior pattern with the secondary air supply and the

pressure behavior pattern without the secondary air supply.

14. The failure diagnosis apparatus according to Claim 6, further comprising supplied air quantity estimating means for estimating a quantity of secondary supply air based on the detected pressure.